

Cambridge IGCSE™

COMBINED SCIENCE

0653/11

Paper 1 Multiple Choice (Core)

October/November 2020

45 minutes

You must answer on the multiple choice answer sheet.

You will need: Multiple choice answer sheet
Soft clean eraser
Soft pencil (type B or HB is recommended)

INSTRUCTIONS

- There are **forty** questions on this paper. Answer **all** questions.
- For each question there are four possible answers **A**, **B**, **C** and **D**. Choose the **one** you consider correct and record your choice in soft pencil on the multiple choice answer sheet.
- Follow the instructions on the multiple choice answer sheet.
- Write in soft pencil.
- Write your name, centre number and candidate number on the multiple choice answer sheet in the spaces provided unless this has been done for you.
- Do **not** use correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.

INFORMATION

- The total mark for this paper is 40.
- Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
- Any rough working should be done on this question paper.
- The Periodic Table is printed in the question paper.

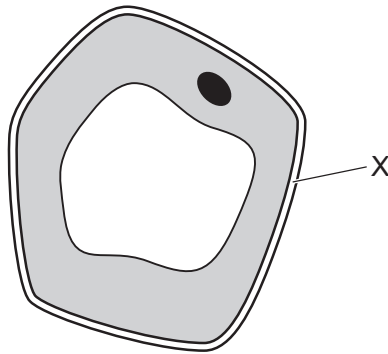
This document has **16** pages. Blank pages are indicated.

1 A motor car has many features that are similar to the characteristics of living things.

Which characteristic of living organisms **cannot** be matched to a feature of a car?

- A release of energy by breaking down energy-rich molecules
- B release of waste materials
- C reproduction of a similar version of itself
- D takes in materials for energy

2 The diagram shows a cell.



What is the function of X?

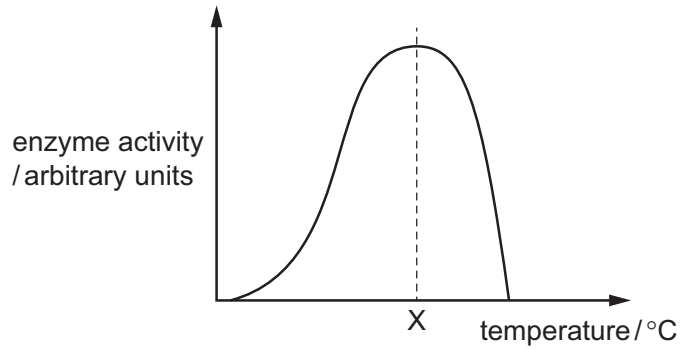
- A contains the genetic information
- B controls substances entering and leaving the cell
- C maintains the shape of the cell
- D photosynthesis

3 A sample of food contains only fat, protein and water.

Which food tests give a positive result when the sample is tested?

	Benedict's solution	biuret solution	ethanol emulsion	iodine solution
A	✓	✓	x	x
B	✓	x	x	✓
C	x	✓	✓	x
D	x	✓	✓	✓

- 4 The diagram shows how the activity of an enzyme changes with temperature.



This enzyme works in the human body.

What is the most likely value of temperature X?

- A** 10°C **B** 40°C **C** 70°C **D** 100°C
- 5 What is necessary for photosynthesis?

- 1 carbon dioxide
- 2 chlorophyll
- 3 glucose
- 4 light
- 5 oxygen
- 6 water

- A** 1, 2, 4 and 6
B 1, 3, 4 and 6
C 2, 3, 4 and 5
D 3, 4, 5 and 6
- 6 Which breakdown processes occur inside cells, and which occur outside cells?

	large molecules to small molecules for absorption	breakdown of glucose to release energy
A	inside	inside
B	inside	outside
C	outside	inside
D	outside	outside

7 Which statement about the pulmonary vein is correct?

- A It carries blood from the heart to the body.
- B It carries blood from the heart to the lungs.
- C It carries blood to the heart from the body.
- D It carries blood to the heart from the lungs.

8 Which statement about adrenaline is correct?

- A It is produced by a gland.
- B It is transported in the red blood cells.
- C It only has one target organ.
- D It reduces the size of the pupils.

9 Which row about whether roots and shoots respond to gravity is correct?

	respond to gravity	
	roots	shoots
A	no	no
B	no	yes
C	yes	no
D	yes	yes

10 Which row describes asexual reproduction?

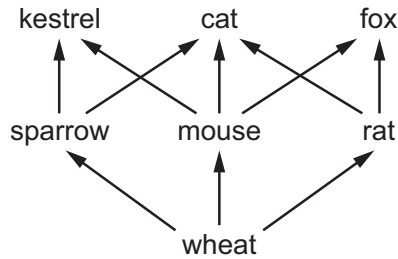
	number of parents	a zygote is produced	offspring identical to the parent
A	1	no	yes
B	1	yes	no
C	2	no	yes
D	2	yes	no

11 Which conditions are needed for the germination of seeds?

- 1 oxygen
- 2 suitable temperature
- 3 water

A 1 and 2 only B 1 and 3 only C 2 and 3 only D 1, 2 and 3

12 The diagram shows a food web.

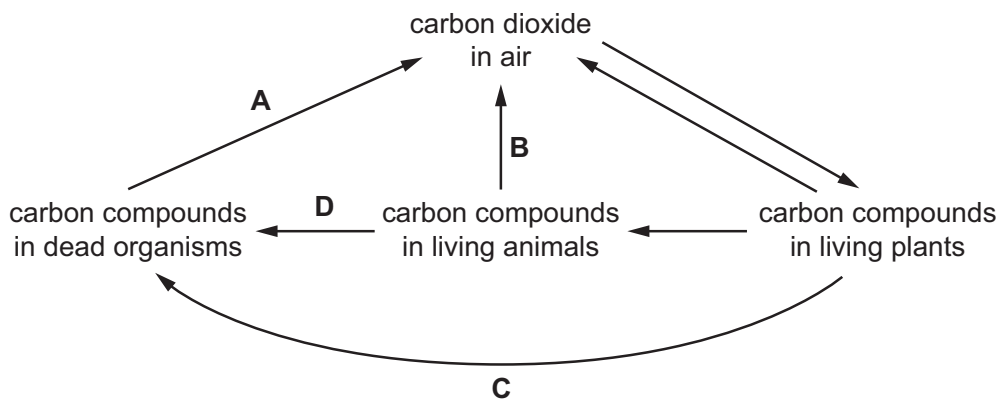


Which sentence correctly describes an organism in the food web?

- A The cat is a herbivore and consumer.
- B The kestrel is a carnivore and consumer.
- C The mouse is a herbivore and producer.
- D The sparrow is a carnivore and consumer.

13 The diagram shows part of the carbon cycle.

Which arrow represents respiration by decomposers?

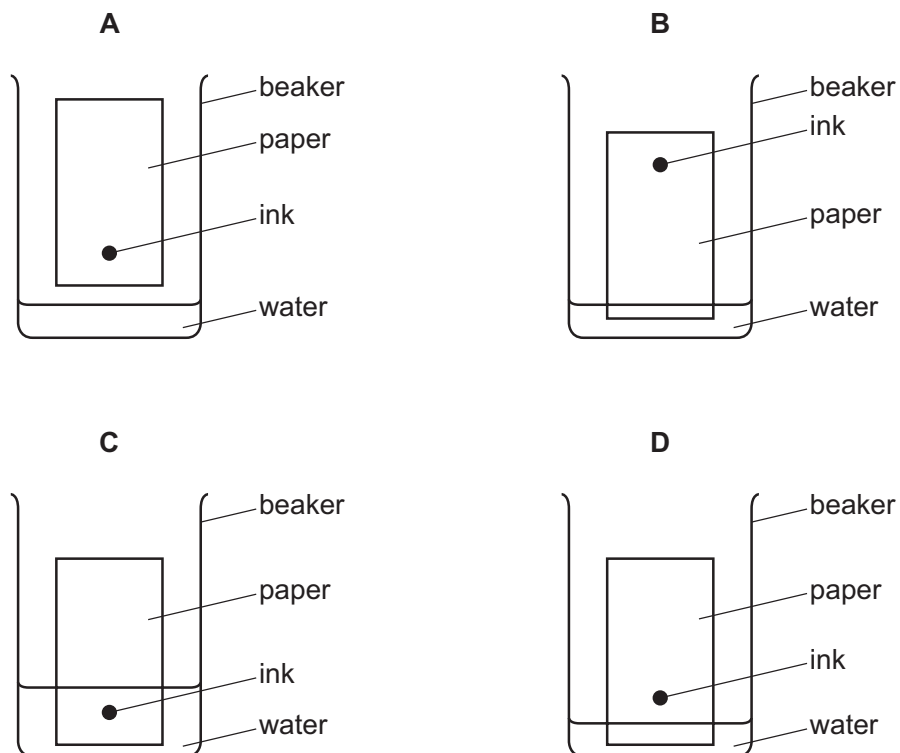


14 Which term describes ammonia, NH_3 ?

- A element
- B ion
- C atom
- D molecule

15 Chromatography separates ink into different colours.

Which diagram shows how the apparatus is set up?



16 Sugar dissolves in water to form sugar solution.

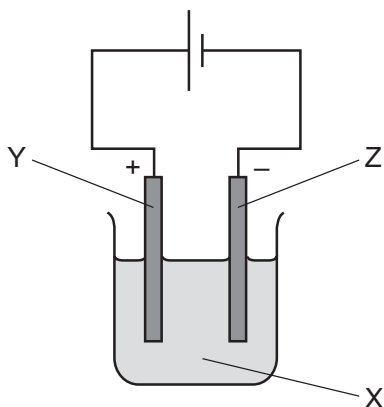
Which word describes the sugar?

- A distillate
- B filtrate
- C solute
- D solvent

17 Which equation is balanced?

- A $\text{Cu} + \text{O}_2 \rightarrow \text{CuO}$
 B $2\text{CO} + \text{O}_2 \rightarrow 2\text{CO}_2$
 C $2\text{Mg} + 2\text{HCl} \rightarrow \text{MgCl}_2 + \text{H}_2$
 D $2\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$

18 The diagram shows apparatus used for electrolysis.



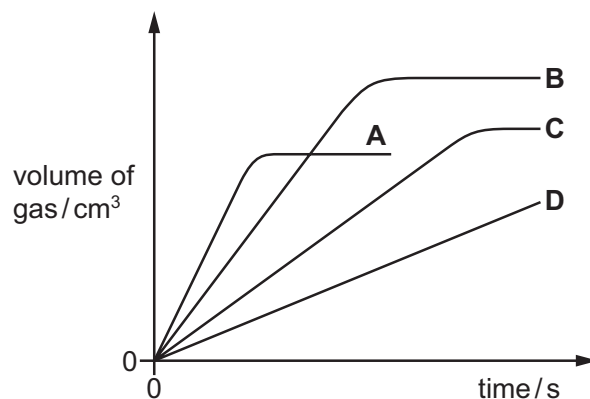
What are X, Y and Z?

	X	Y	Z
A	electrode	anode	cathode
B	electrode	cathode	anode
C	electrolyte	anode	cathode
D	electrolyte	cathode	anode

19 Which temperature changes occur during exothermic and endothermic reactions?

	exothermic	endothermic
A	decreases	increases
B	decreases	no change
C	increases	decreases
D	increases	no change

20 Which line on the graph represents the reaction with the greatest rate?



21 Which substances react with dilute sulfuric acid to make copper sulfate?

- 1 copper
- 2 copper carbonate
- 3 copper hydroxide
- 4 copper nitrate

A 1 and 2 **B** 1 and 4 **C** 2 and 3 **D** 3 and 4

22 Acid X reacts with metal Y.

A colourless gas is given off and a pale green solution is produced.

Two tests are carried out on the solution.

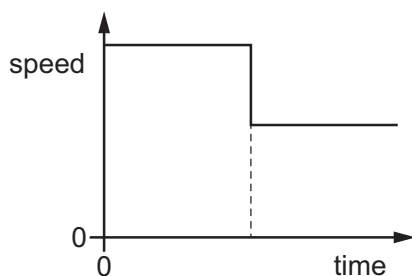
test	reagent(s) added	result
1	aqueous silver nitrate and nitric acid	white precipitate
2	aqueous sodium hydroxide	green precipitate

What are acid X and metal Y?

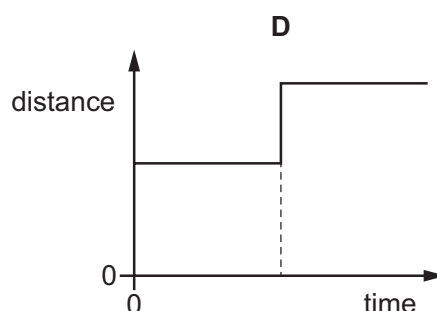
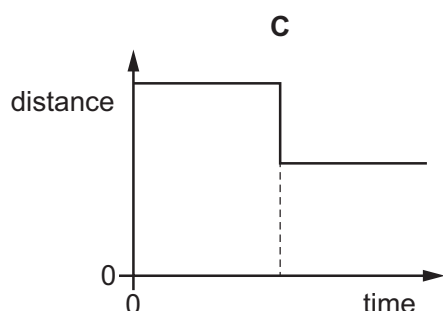
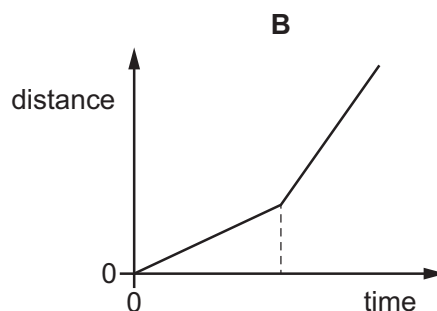
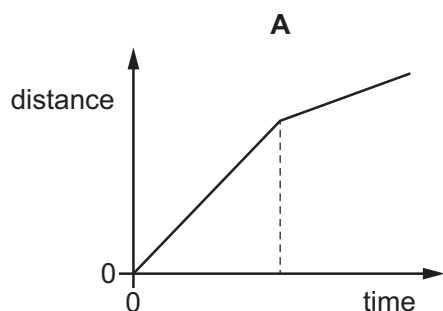
	acid	metal
A	hydrochloric	iron
B	hydrochloric	zinc
C	sulfuric	iron
D	sulfuric	zinc

- 23 Which statement about the Periodic Table is **not** correct?
- A It lists all the known elements.
 - B Non-metallic elements are placed on the right-hand side.
 - C The position of an element helps us to predict its properties.
 - D Vertical columns in the Periodic Table are called periods.
- 24 Ammonia, NH_3 , can be made by combining the gases nitrogen, N_2 , and hydrogen, H_2 .
This reaction is slow.
When element Y is added, the rate of reaction increases.
What is Y?
- A Al
 - B Fe
 - C Rb
 - D I_2
- 25 Which method is used to extract copper from copper(II) oxide?
- A dissolving copper(II) oxide in hydrochloric acid and then filtering
 - B dissolving copper(II) oxide in water and then filtering
 - C heating the copper(II) oxide
 - D heating the copper(II) oxide mixed with carbon
- 26 Which process does **not** produce carbon dioxide?
- A fractional distillation of petroleum
 - B the complete combustion of methane
 - C the reaction between an acid and a carbonate
 - D the thermal decomposition of calcium carbonate
- 27 Which statement describes a hydrocarbon?
- A a compound that burns to form carbon dioxide and hydrogen
 - B a compound that contains carbon and hydrogen only
 - C a compound that only contains ionic bonds
 - D a compound that reacts easily with metals

28 The diagram shows the speed–time graph for a car travelling along a horizontal road.



What is the distance–time graph for this part of the journey?



29 A solid metal cube of side 5.0 cm has a mass of 250 g.

What is the density of the metal?

- A** 0.50 g/cm³ **B** 2.0 g/cm³ **C** 10 g/cm³ **D** 50 g/cm³

30 A raindrop falls vertically at a constant speed.

What is the resultant force on the raindrop as it falls?

- A** It is equal to the air pressure on the drop.
B It is equal to the air resistance on the drop.
C It is equal to the weight of the drop.
D It is zero.

31 An object is not moving. Work is done on the object and it moves a known distance.

What other single measurement is needed to calculate the amount of work done?

- A** the acceleration of the object
- B** the direction of movement of the object
- C** the force applied to the object in the direction of movement
- D** the speed of the object

32 An apple falls to the ground.

Which form of energy decreases as the apple falls?

- A** chemical potential
- B** gravitational potential
- C** kinetic
- D** sound

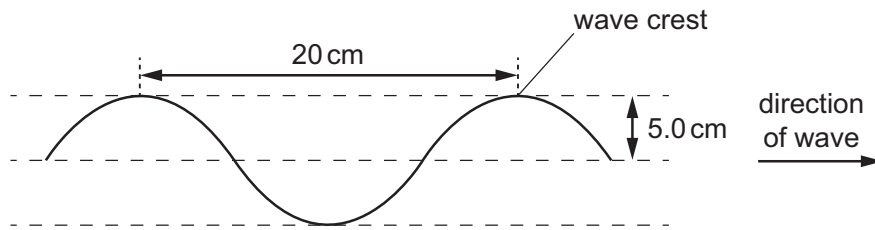
33 What happens as a liquid starts to evaporate?

- A** The mass of the remaining liquid increases.
- B** The mass of the remaining liquid is constant.
- C** The temperature of the remaining liquid decreases.
- D** The temperature of the remaining liquid increases.

34 In which states of matter can convection occur?

	in a solid	in a liquid	in a gas
A	no	no	yes
B	no	yes	yes
C	yes	no	no
D	yes	yes	no

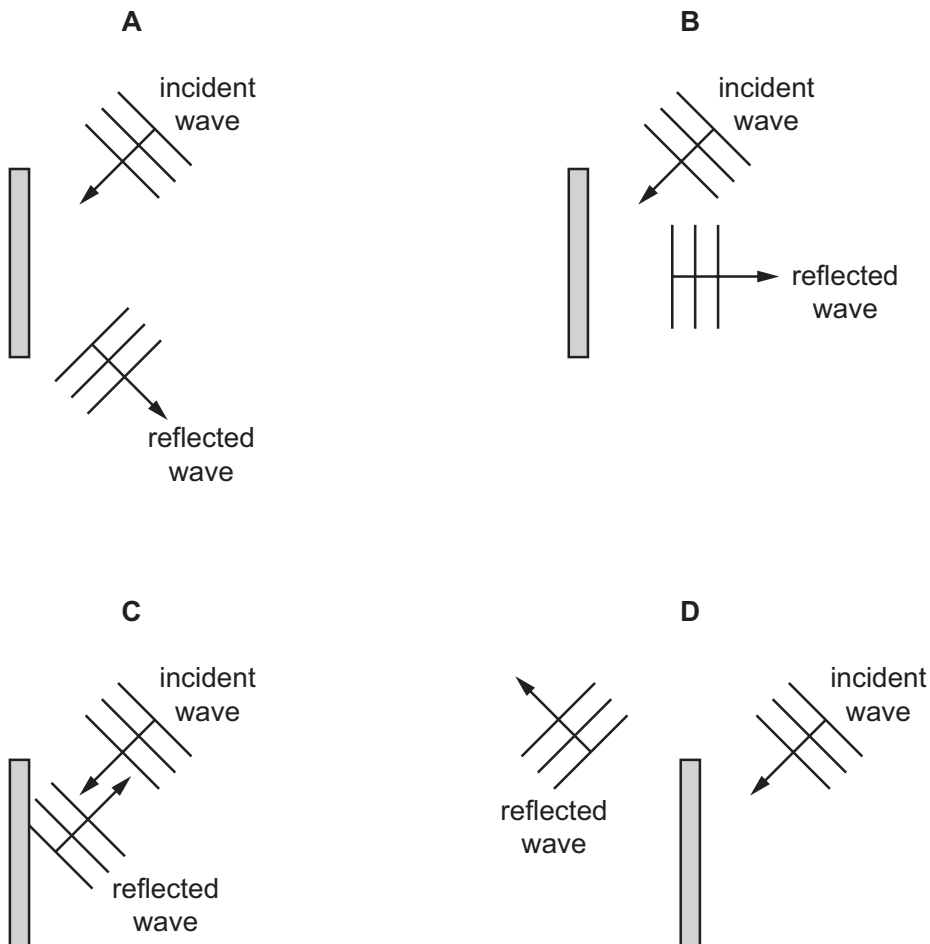
- 35 The diagram shows a section of a rope.
 Four wave crests pass a point on the rope every second.
 Each wave crest travels 80 cm in one second.



What is the speed of the wave?

- A 4.0 cm/s B 5.0 cm/s C 20 cm/s D 80 cm/s
- 36 A water wave strikes a plane barrier.

Which diagram shows the direction of travel of the reflected wave?



37 Which substance is an electrical insulator?

- A aluminium
- B copper
- C plastic
- D steel

38 A power supply causes a current in a circuit.

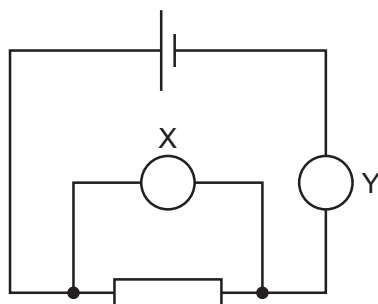
The electromotive force (e.m.f.) of the power supply and the resistance of the circuit are both changed.

Which pair of changes **must** result in a smaller current in the circuit?

	e.m.f.	resistance
A	decreased	decreased
B	decreased	increased
C	increased	decreased
D	increased	increased

39 The diagram shows a cell connected to a resistor and two meters, X and Y.

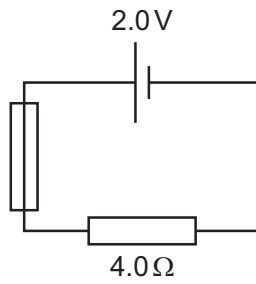
The circuit is used when determining the resistance of the resistor.



What are the quantities measured by meters X and Y, and what are their correct units?

	meter X		meter Y	
	quantity	unit	quantity	unit
A	current	A	p.d.	V
B	current	V	p.d.	A
C	p.d.	A	current	V
D	p.d.	V	current	A

40 The diagram shows a circuit containing a 2.0 V cell, a fuse and a resistor of resistance 4.0 Ω .



What is the most appropriate rating for the fuse?

- A** 0.4 A **B** 1 A **C** 2 A **D** 5 A

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The Periodic Table of Elements

		Group															
I	II	III	IV	V	VI	VII	VIII										
3 Li lithium 7	4 Be beryllium 9	1 H hydrogen 1	5 B boron 11	6 C carbon 12	7 N nitrogen 14	8 O oxygen 16	9 F fluorine 19	10 Ne neon 20									
11 Na sodium 23	12 Mg magnesium 24	13 Al aluminium 27	14 Si silicon 28	15 P phosphorus 31	16 S sulfur 32	17 Cl chlorine 35.5	18 Ar argon 40										
19 K potassium 39	20 Ca calcium 40	21 Sc scandium 45	22 Ti titanium 48	23 V vanadium 51	24 Cr chromium 52	25 Mn manganese 55	26 Fe iron 56	27 Co cobalt 59	28 Ni nickel 59	29 Cu copper 64	30 Zn zinc 65	31 Ga gallium 70	32 Ge germanium 73	33 As arsenic 75	34 Se selenium 79	35 Br bromine 80	36 Kr krypton 84
37 Rb rubidium 85	38 Sr strontium 88	39 Y yttrium 89	40 Zr zirconium 91	41 Nb niobium 93	42 Mo molybdenum 96	43 Tc technetium —	44 Ru ruthenium 101	45 Rh rhodium 103	46 Pd palladium 106	47 Ag silver 108	48 Cd cadmium 112	49 In indium 115	50 Sn tin 119	51 Sb antimony 122	52 Te tellurium 128	53 I iodine 127	54 Xe xenon 131
55 Cs caesium 133	56 Ba barium 137	57–71 lanthanoids	72 Hf hafnium 178	73 Ta tantalum 181	74 W tungsten 184	75 Re rhenium 186	76 Os osmium 190	77 Ir iridium 192	78 Pt platinum 195	79 Au gold 197	80 Hg mercury 201	81 Tl thallium 204	82 Pb lead 207	83 Bi bismuth 209	84 Po polonium —	85 At astatine —	86 Rn radon —
87 Fr francium —	88 Ra radium —	89–103 actinoids	104 Rf rutherfordium —	105 Db dubnium —	106 Sg seaborgium —	107 Bh bohrium —	108 Hs hassium —	109 Mt meitnerium —	110 Ds darmstadtium —	111 Rg roentgenium —	112 Cn copernicium —	114 Fl flerovium —	116 Lv livermorium —				

Key

atomic number

atomic symbol

name

relative atomic mass

lanthanoids	57 La lanthanum 139	58 Ce cerium 140	59 Pr praseodymium 141	60 Nd neodymium 144	61 Pm promethium —	62 Sm samarium 150	63 Eu europium 152	64 Gd gadolinium 157	65 Tb terbium 159	66 Dy dysprosium 163	67 Ho holmium 165	68 Er erbium 167	69 Tm thulium 169	70 Yb ytterbium 173	71 Lu lutetium 175
actinoids	89 Ac actinium —	90 Th thorium 232	91 Pa protactinium 231	92 U uranium 238	93 Np neptunium —	94 Pu plutonium —	95 Am americium —	96 Cm curium —	97 Bk berkelium —	98 Cf californium —	99 Es einsteinium —	100 Fm fermium —	101 Md mendelevium —	102 No nobelium —	103 Lr lawrencium —

The volume of one mole of any gas is 24 dm³ at room temperature and pressure (r.t.p.).

